# User's Manual

# Backup Parking Sensor System

4 Rear In-Bumper Type Sensors
Wireless LED Display with Built-in Audible Alert

For Cars, VANs, SUVs, and Trucks

**MODEL 4015N**

FC CE ISO9001

http://parkingsensors.net

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## 4 Rear In-Bumper Type Sensors
## Wireless LED Display with Built-in Audible Alert
## For Cars, VANs, SUVs, and Trucks

### *Included in the Box*

- **4x Sensors** with attached cable and 2-pin mini plug. Cable Length: 2.5m (8.2ft)
- **4x Wedge-Shaped Plastic Sensor Spacers** for non-vertical bumper
- **1x Control Box**
- **1x Power Cable for Control Box** with 3-pin mini plug. Cable Length: 1.0m (3.3ft)
- **1x 3M Double-Sided Self-Adhesive Pad** for affixing Control Box
- **1x Wireless LED Display** with attached power cable (2.0m or 6.5ft) and cigarette lighter type plug, double-sided self-adhesive pad on bottom of display
- **1x Drill Bit (Hole Saw)**- Φ21mm (13/16")
- **1x User's Manual**

### *Features*

- 4 Rear Sensor Backup Parking System
- In-bumper type sensors to give the look of factory installed system
- System activated when vehicle is in reverse
- Wireless LED Display with built-in audible alert (beeper) and On/Off switch
- 7 LED Lights (Green/Yellow/Red) on each side of the display indicating orientation of obstacle and Safe/Warning/Stop zone
- Designed for cars, VANs, SUVs, and trucks
- Distance display in feet or meters (optional)
- Limited 12 Month Warranty

### *Specifications **

- CE FCC ISO9001 Approved
- Wireless RF Range: 0~20m (65.6ft)
- RF Frequency: 433KHz
- Operating Voltage: DC 10.5V ~ 16V
- Detecting Range: 0.3m ~ 1.5m (1ft ~ 4.9ft) Displayed as 0.0 when less than 0.3m (1ft)
- Measuring Error: ± 0.1m (or 0.1ft)
- Sensor Detection Angle: 90°
- Detection Response Time: 300ms
- Sensor Diameter: Φ21mm (13/16")
- Audible Alert when obstacle within: 0.1m ~ 1.5m (0.3ft ~ 4.9ft)
- Ultrasonic Frequency: 40Khz
- Audible Alert Volume: 73 db
- Maximum Power Consumption: 3.6W
- Current Consumption: 50~180mA
- Operating Temperature Range: -30 ~ +70°C
- Dimensions of the Wireless Display: Width x Depth x Height = 13.4cm x 3.0cm x 2.8cm (5.2" x 1.2" x 1.1")
- Dimensions of the Main Control Box: Width x Depth x Height = 9.8cm x 7.0cm x 2.1cm (3.8" x 2.7" x 0.83")

* The specifications & features are for reference only. They may be changed without prior notice.

### *Tools Needed*

Φ21mm (13/16") drill bit (include), drill, tape measure, chalk or marker, wire stripper, vinyl electrical tape, cable/wire ties, voltage meter, screw driver set, pliers.
**Note:** Use a bi-metal 21mm (13/16") drill bit (not included) if drilling through metal bumpers.

## How the System Works

The Backup Parking Sensor System determines obstacle distance by measuring the time needed for the ultrasonic wave emitted by a sensor to reach an obstacle and for the sensor to receive the ultrasonic wave reflected from the obstacle. Given the speed of the ultrasonic wave, the system can then calculate and display the distance between the sensor and the obstacle.

To have the look of factory installed system, the system comes with 4 in-bumper type sensors to be installed in the rear bumper by drilling holes through the bumper. ❖ The main control box is powered by tapping into the back up light wires so that the system will work only when vehicle is put in reverse. ❖ It is supplied with a wireless LED digital display which shows the exact distance from an obstacle and eliminates the wiring between the display and main control box. The wireless display can be mounted up to 20m (66 feet) away from the main control box (still requires its own +12V power supply). This is especially convenient for installation on long vehicles. ❖ The wireless display can be powered by cigarette lighter, ACC or ignition switch. ❖ Seven (7) LED Lights (3xGreen/2xYellow/2xRed) on each side of the wireless display indicate both orientation of obstacle and Safe/Warning/Stop zone. ❖ The audible alert (beeper) with on/off switch is built in the wireless display. It beeps faster as vehicle gets closer to obstacle and sounds continuously when vehicle is within 0.3m (1ft) from obstacle.

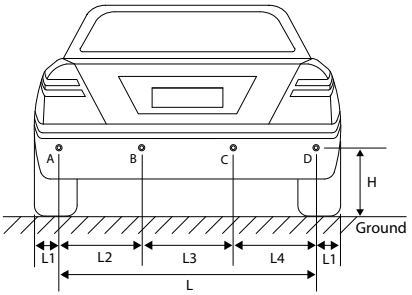



**Fig.1** Mounting Height and Position of Sensors
H = 50 ~ 80cm (20" ~ 32")
L1 = 6 ~ 15cm (2" ~ 6")
L2 = L3 = L4 or L2 = L4 = 0.3L, L3 = 0.4L

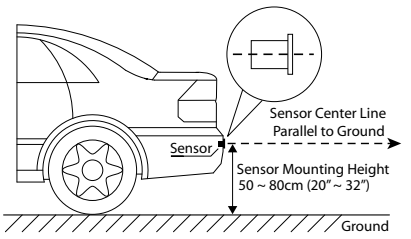
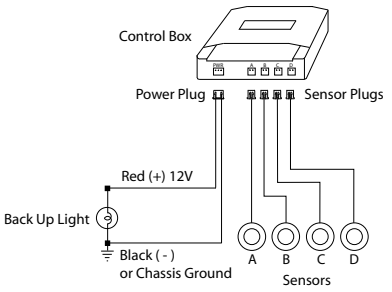



**Fig.2** Mounting Height and Angle of Sensor



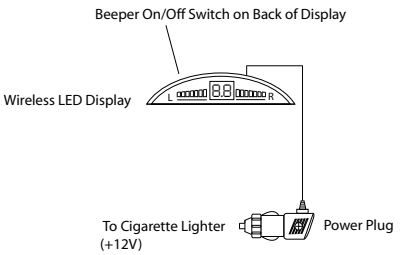




**Fig. 3** Control Box, Wireless LED Display, and Wiring



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**IMPORTANT: (a)** *Read this manual thoroughly before proceeding to installation. You can also have the system installed by a professional installer such as your local auto mechanic/auto electrician/car stereo store.* ***(b)*** *Turn off the engine and ACC during installation.* ***(c)*** *Double check that all wiring is correct before powering on the system.* ***(d)*** *During installation, avoid flatting, perforating, cutting, and extending the wires of sensors to reduce unnecessary signal loss.*

**1. Installing the Control Box**

a ) Find a flat and clean surface inside the vehicle close to driver's side taillight assembly as the control box gets its power from the back up light and has all the rear sensors plugged into it. Also, the location for the control box should have no or less metal parts/pieces between the control box and the wireless display. Keep the control box away from areas of high heat, high humidity, direct sunlight, and electromagnetic devices. As the control box is not water-proof type, you need to mount the control box to a location that is protected from water.

b ) Place the control box in place temporarily without securing it to the vehicle as you may need to adjust the location of the control box while wiring.

c ) After completing all wiring, use the double-sided self-adhesive pad included to secure the control box to the vehicle.

**Important Notes for Installing the Control Box:**

Don't mount the control box near or under the dash or in the cab of a truck.
The control box is designed to be mounted near the rear end of a vehicle (near taillight assembly) to avoid interferences from the engine which may cause false alert such as continuous beeping and 0.0 display.

As this is a backing up sensor system with wireless display, **the communication between the wireless display and control box need to be established for the system to work properly.**

After installation, if you find that the wireless display can not keep its lights on for more than 3 seconds, then the communication between the wireless display and control box may be blocked / shielded by metal parts/pieces/panels/enclosures.

If this is the case, move the control box to a different location or mount the control box in a small water-proof plastic box (not included with the system) then affix it to a location that has no or less metal parts/pieces between the control box and the wireless display.

**Installing the control box in taillight assembly** may work for some vehicles that does not have metal enclosures or metal panels around the taillight assembly, but if the taillight assembly of your vehicle has metal enclosures or metal panels around it, then the communication between the wireless display and control box may be blocked/shielded which may cause the system not to work properly or at all.

**Note:** Some lights (turn signal/brake/reverse/stop lights) may emit interferences that can affect the signals the control box receives therefore cause the system to give false alert. After installation, if you experience **false alert caused by turn signal light**, **or brake/reverse/stop lights,** try to put the control box as far as possible away (at least 12 inches) from the taillight assembly (turn signal/brake/reverse/stop lights).

**2. Installing the Wireless LED Display**

a ) Find a place for the wireless LED display on top of the dashboard where the driver can see it easily. Place the wireless display in place temporarily without securing it to the top of the dashboard.

b ) After completing all wiring, secure it with the included self-adhesive pad on the bottom of the display base.

**3. Wiring Power to the Wireless LED Display**

There are two methods for powering the wireless LED display:

a ) Method [1]: The wireless display comes with attached power cable and a cigarette lighter type plug. Simply Insert the plug into the cigarette lighter jack.(Fig. 4).

b ) Method [2]*****: If you want to route and hide the power cable of the display, you may cut off the cigarette lighter type plug from the power cable, and wire the cable directly to ACC or "ON" block of the ignition switch. Strip 1" of the wires. Connect the red wire to +12V and the black wire to (-) negative or chassis ground. Wrap the connections with vinyl electrical tape.
*** Note: although the power wires of the display can be cut off for more flexible installation, display with its power wires cut off voids warranty on it.**

**4. Wiring Power to the Control Box**

a ) Insert the 3-pin plug of the power cable of the control box into its socket labeled PWR on the side of the main control box (Fig. 3).

b ) Locate the +12V and the (-) negative wires from the back up light near the taillight assembly. If necessary, remove the taillight assembly to locate them.

c ) Strip 1/2" of the wires found.

d ) Connect the red wire of the power cable to the +12V wire (Fig. 3)

e ) Connect the black wire of the power cable to the (-) negative or chassis ground (Fig. 3).

f ) Wrap the connections with vinyl electrical tape.

**5. Installing the Sensors**

**IMPORTANT: (a)** *To avoid false alert from the system detecting the ground, the sensors should be mounted between 50cm to 80cm (20" to 32") above the ground and the face of the sensors need to be vertical or slightly upward angled (Fig. 2).* ***(b)*** *Horizontally, the sensors should be equally spaced if possible or symmetric to the center of the bumper.* ***(c)*** *The outer two sensors should be mounted about 15cm (5.9") from the corner of the bumper for better corner coverage.*
**Note:** The bumper surface for mounting the sensors should be as flat and vertical as possible.

**For exact color match,** you may have the sensors spray-painted. For best results, spray paint no more than two thin coats (not to be applied with brush or touch-up). And it is recommended that you have the sensors professionally painted by an auto body shop.
**Note: although the sensors can be spray-painted for exact color match to your vehicle, sensors painted void warranty on them.**

a ) Refer to Fig. 1 for mounting height and positioning of the sensors.

b ) Work under the rear bumper to check the internal structure of it before marking the positions for drilling holes. You may need to remove the bumper if the view is blocked,.

c ) With chalk or marker, mark the position of sensors on the rear bumper. Make sure that the sensors can be pushed all the way in and that you can feed the wires through.

d ) Drill the holes through the bumper at the marks with the Φ21mm drill bit included. **Note:** if drilling through metal bumper, use a bi-metal Φ21mm (13/16") drill bit (not included).

e ) If necessary, smooth the sharp edge of the holes with a polishing head or small round file.

f ) **If you have a non-vertical bumper,** you may need to use the wedge-shaped plastic sensor spacers provided. Carefully push each sensor into its sensor spacer to avoid breaking it.

g ) Run the sensor wires into the holes drilled. Push the sensors into the holes. **Note:** When pushing in the sensors only apply pressure at the edges, not on the middle of the sensor to avoid damage to the sensor element. The sensors are tapered for a snug fit.

h ) Run the sensor wires from the bumper into the trunk or inside of the vehicle through the existing small vent or rubber grommet in the rear of the trunk or vehicle, and to the control box. **Note:** Do not cut the sensors wires.

i ) Attach sensor wires to the vehicle body with cable/wire ties so that they will not get in the way of any moving parts and there are no loose wires hanging down.

j ) Plug one sensor at a time into its corresponding socket at the control box, start the engine and put the vehicle in reverse, the display should show the correct obstacle distance. Repeat the procedure for the remaining sensors.

**Installing Sensors in Metal Bumpers**
If you have a continuous beeping or false alert problem after installation of the system, unplug all sensors from the control box, and then plug back in one sensor at a time and test to find out which specific sensor(s) is causing the problem.

If you find a sensor that is causing false alert, please check if the sensor hole in the bumper is too tight as instructed below, especially if you installed the sensors in a metal bumper:
If a sensor causes false alert or gives inconsistent results, pull it out of its hole in the bumper for about 0.5 inch, tape it to the bumper so it faces upward a little bit and see if the false alert will stop. If the false alert stops, then the hole drilled for the sensor is a little bit tight which can apply pressure on the sensor and cause the system to give false alert.
If this is the case, then carefully enlarging the hole a little bit with a small round file should solve the problem.

## *Testing Your New Parking Sensor System*

Back your vehicle slowly (about 3 miles per hour) to approximately 2.5m (8.2 feet) from a flat vertical surface such as a wall. Continue to back up slowly and check the performance against Chart 1. Have someone watch the rear of the vehicle for you while you are doing the test.

**Note:**
[1] The wireless display will light up only when the control box is on (vehicle is in reverse).
[2] When you shift into reverse gear, the system will beep once indicating it is activated.

## *Using the Wireless LED Display*

The display has a built-in beeper (audible alert). There are seven (7) LED Lights (Green/Yellow/Red) on each side of the two-digit distance display (Fig. 4). The color LED lights have two functions: indicating the orientation of obstacle and showing if you are in Safe, Warning, or Stop zone (Chart. 1).

**Chart 1. Orientation of Obstacle, Digital Distance Display, and Beeping (Audible Alert)**

| Obstacle Distance | Viewing from the Front of the Display | | | |
|---|---|---|---|---|
| | LEDs on the Left Side of the Display Responding to Sensor A or B | Beeping | Digital Distance Display | LEDs on the Right Side of the Display Responding to Sensor C or D |
| **Safe Zone (> 2.0m)** | Outer Green Flashing | No | -.- | Outer Green Flashing |
| **Safe Zone (2.0~1.5m)** | Outer Green on | Starting to beep at 1.5m | Actual distance | Outer Green on |
| **Warning Zone (1.5~1.0m)** | 1 - 3 Green on | Fast | Actual distance | 1 - 3 Green on |
| **Warning Zone (1.0~0.7m)** | 3 Green/1 -2 Yellow on | Faster | Actual distance | 1 -2 Yellow/3 Green on |
| **Stop Zone (0.7~0.3m)** | 3 Green/2 Yellow/1 - 2 Red on | Fastest | Actual distance | 1 - 2 Red/2 Yellow/3 Green on |
| **Stop Zone (0.3~0.0m)** | 3 Green/2 Yellow/2 Red on | Continuously | 0.3 or 0.0 | 2 Red/2 Yellow/3 Green on |

- *(Note: 1meter = 3.3feet)*


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***Detection Range of the System***

The parking sensor system detects obstacle by emitting ultrasonic wave and receiving reflected ultrasonic wave from an obstacle. Different materials have different reflection and absorption of the ultrasonic wave, and the actual detection distance varies depending on what materials an obstacle is composed of. Human skin and clothes actually absorb the ultrasonic wave, and can only reflect very small portion of the ultrasonic wave back to the sensors, hence **the system may detect human skin and clothes within a much shorter range compared to other materials.** Drivers in these situations should pay more attention while parking their vehicles.

## *Warnings*

- To avoid collision with obstacle because of the inertia of vehicle while backing up/parking, **keep your vehicle speed at about 3 miles per hour** and stop the vehicle immediately once you hear the continuous beeping. This is because even if brake is applied, your vehicle will still go for some distance (inertia) before it comes to a complete stop.
- Because the back up parking system detects obstacle by emitting ultrasonic wave and receiving reflected ultrasonic wave from obstacle, the system may fail to give both visual and audible alert if an obstacle has smooth ball-shaped or sloped surfaces as such surfaces may not reflect ultrasonic wave back to the sensors. Drivers in these situations should pay more attention while parking their vehicle.
- In heavy falling rain or snow, the system may give alert as falling rain or snow may be detected as obstacles. Keep surface of sensors clean of snow, mud, dirt, and other debris. Turn the beeper off if needed.

## *Troubleshooting*

| *Problem* | *Cause* | *Solution* |
|---|---|---|
| **Display doesn't light up when reversing** | No power to the display.<br>No power to the control box.<br>Faulty display or control box. | Check display power connection.<br>Check control box power connection.<br>Replace display or control box.<br>Contact Technical Support for help. |
| **Display light up but system is not detecting any obstacle** | Sensors not connected.<br>Faulty display.<br>Faulty control box. | Check sensor connection.<br>Replace display.<br>Replace control box.<br>Contact Technical Support for help. |
| **System showing distance but no beeping or system beeping but no distance display** | Beeper turned off.<br>Faulty display.<br>Faulty control box. | Put beeper on/off switch to on position.<br>Replace display.<br>Replace control box.<br>Contact Technical Support for help. |
| **Wrong LEDs light up** | Sensors are plugged into the wrong sockets at the main control box | Install the sensors in the bumper as labeled in Fig. 1 and plug sensors as labeled on the sensor wires into their corresponding sockets at the control box (Fig. 3) |
| **Display constantly shows 0.0 or beeps continuously** | Object within 0.30m is detected.<br>Holes drilled for sensor are too tight (especially for a metal bumper). | Unplug all sensors, and then plug back in one sensor at a time to find out which sensor is causing the problem. Adjust angle of the sensor. Refer to **5. Installing the Sensors** for details. Carefully enlarging sensor holes a little with a small round file. |
| **Display shows a distance and beeps even there is no obstacle behind** | Ground is detected.<br>Sensor pointing angle is low.<br>Sensor is installed too low (mounting height below 0.5m).<br>Holes drilled for sensor are too tight (especially for a metal bumper). | Unplug all sensors, and then plug back in one sensor at a time to find out which sensor is causing the problem. Adjust angle of the sensor. Refer to **5. Installing the Sensors** for details. Carefully enlarging sensor holes a little with a small round file. |

***For more installation related questions and Frequently Asked Questions (FAQs) with answers, and product photos, visit our Web site at*** http://parkingsensors.net

## *Terms & Conditions, Return Policy, and Warranty*

**IMPORTANT:** the parking sensor systems and parts sold and distributed by us are only devices used to assist a driver while parking. They should not be considered as a substitute for driver responsibility when operating a vehicle. No warranty as to operational efficiency is granted. We don't guarantee or assume liability for collisions or damages that take place when parking your vehicle with use of the parking sensor systems or parts. We will not be liable for any claims, actions, suit proceedings, costs, expenses, damages or liabilities arising out of use of the systems or parts. By placing an order for the parking sensor system(s) or parts, customer agrees to take full responsibility of use of such system(s) or parts.

Returns/exchanges can only be accepted if they are within 15 days of your receipt of your order.

Before your return, you must e-mail our Customer Service to get your **Return Merchandise Authorization Number (RMA#)** for your return to be processed.

We offer 12-month limited warranty on our products from date of purchase. After an item(s) is/are returned to us, it/they will be checked and tested by our technical support. If the item(s) is/are found as defective in materials and workmanship, and qualified for our warranty, they will be either repaired or replaced for free (shipping cost excluded). If they are found as not qualified for our warranty, then you need to pay for the repaired or replacement items at their full retail prices (see below: Items with the following conditions are not qualified for our warranty).

The warranty excludes defects or damage due to misuse, abuse or neglect.
This warranty does not cover any cost incurred in inspection, installation and repair services involved.

**Items with the following conditions are not qualified for our warranty:**
Customer can cut or extend wires or cables for more flexible installations, but please note that items with wires or cables cut void the warranty on the items.

Customer can paint sensors to match his vehicle color, but please note that sensors painted by customer void the warranty on the sensors.

Sensors with any type of glue or silicone applied void the warranty on the sensors.

Items with seal (if any) broken, case (if any) opened, repaired, modified, or disassembled by customer void the warranty.

**Items for return must be in new, uninstalled, unused, re-sellable condition, including the original packaging, manufacturer's containers, documentation, warranty cards, manuals, and all accessories.**

**Re-packing and Re-stocking fee:**
Unopened returns are subject to a 15% re-stocking fee.
Opened returns are subject to a 25% re-packing and re-stocking fee.
Returns which are damaged or have parts missing (not caused by shipping process) may be subject to a greater re-stocking fee, or charged at their full retail prices and deducted from refund amount.



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Shipping and Handling fee is not refundable.

**Returns are not acceptable if the packaging is not in its original condition or the item has been used or installed.**

International orders are not returnable.

If a domestic or international shipment is refused by the customer or customs and returned back to us, a 15% restocking fee will apply less the shipping cost and any other fees incurred if any to the customer. It is the customer's responsibility to make all arrangements with us for refused shipments.

**Note:**
You are responsible for the shipping and handling cost to mail the defective parts, returns, exchanges, and items for Warranty back to us and for us to ship them to you.

You are responsible for the customs duty, tariff or import tax charged by the customs in your country.



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## *Customer Service and Technical Support*

For customer service and technical support, visit our Web site as listed below, then click on the link Contact Us.



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## *Spare and Replacement Parts*

To order spare and replacement parts for your system, visit our Web site as listed below, then click on the link Spare and Replacement Parts.



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The specifications and features of the system, Terms & Conditions, Return Policy, and Warranty included in this User's Manual are subject to change without prior notice.



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